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ABSTRACT

This bulletin is one in a series of environmental education activity guides for grades K-12, developed and field-tested by teachers in the Montgomery County (Maryland) Public Schools. Primarily for use in the middle grades four through six, the guides are not intended to constitute complete units in themselves. They are, rather, a compilation of activities considered appropriate for particular environmental studies. In this guide about the megalopolis, for grades four through eight, the 31 activities are divided into three categories: Analysis of Residential Communities, Identifying Characteristics of Commercial/Industrial Areas, and Identifying Patterns of City Growth and Land Use. Each activity includes the instructional objective, procedures to follow, and materials required. A student evaluation sheet follows each category and the bulletin concludes with a list of suggested discussion questions. Related documents in the series are SE 015 885 through SE 015 890 and SE 015 892 through SE 015 893. (BL)

Activities for Studying

Megalopolis

MONTGOMERY COUNTY PUBLIC SCHOOLS · ROCKVILLE, MARYLAND · Homer O. Elsenrood · Superintendent of Schools

Environmental Education Series · Bulletin No. 247-H

ENVIRONMENTAL EDUCATION SERIES
ACTIVITIES FOR STUDYING MEGALOPOLIS
GRADE LEVEL 4 – 8

Bulletin No. 247-H

Montgomery County Public Schools
Rockville, Maryland
Homer O. Elseroad
Superintendent of Schools

INTRODUCTION

For some time, there has been a need for curriculum materials to assist teachers who wish to move the teaching/learning experience beyond the school walls. Although individual schools have prepared materials useful to their own unique purposes, such information and teaching aids have not generally been shared with other schools.

This series of bulletins on Environmental Education was developed after arrangements were made in Area 11 for approximately a dozen 12-month teachers to produce outdoor education materials during the summer of 1969. Field testing of these materials occurred, primarily in Area 11, during the 1969-70 school year.

In the summer of 1970, an Outdoor Education Curriculum Development Workshop was conducted at Randolph Junior High School, during which twelve teachers developed additional materials and reviewed and tested those prepared earlier.

The bulletins in this Environmental Education series are not intended to constitute complete units in themselves. They are, rather, a compilation of activities considered appropriate for particular environmental studies. Whether the series should be used separately or as a supplement to other aids should be determined by the needs and purposes of each teacher and his students.

A word of explanation about format: Each activity suggested has its own stated instructional objective. The achievement of that objective will be an individual experience for each student, even though in some cases the procedures suggested may be group- rather than individually-directed.

PURPOSE

It is intended that through participation in these activities, both students and teachers will understand that a megalopolis is the product of metroplitan growth in which suburban expansion results in cities' growing together. From observation and research, they will find what has happened and what is happening, and will predict what is likely to happen in and around cities. Attention is directed to those aspects of megaloplis that will lead students to make their own value judgements, their own suggestions for controls and changes, and more careful observations of their surroundings. They will list possible alternative plans for growth and predict results of these plans.

The instructional objectives are not prescriptive. Teachers may find that some of the activities are inappropriate for children in their community and will choose to omit or to modify them. Most of the activities are intended to take place outdoors in walking or bussing trips, with follow-up discussion or map study indoors. Almost all the observations from bussed field trips can be made on the routes to and from some point of interest chosen for reasons other than pure study of megalopolis. Teachers may ditto tables or charts for students' records. Combining some of the instructional objectives with other aspects of science and social studies would be a useful way to keep the study of megalopolis an ongoing concern. The study can best be done over a long enough period of time for students to observe changes. The possibilities of varying degrees of sophistication in observing, recording, and interpreting make it appropriate for students of Grades 4 through 8.

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PART I – Analysis of Residential Communities

The following kinds of activities are suggested for field trips and walks through residential sections. The study of residential communities is best achieved by comparing and contrasting at least two different areas. It is suggested that the teacher refrain from making value-judgment statements during the data collection and observational parts of this study. Eventually students will be able to discuss and state desirable community characteristics based on their own value systems. It is particularly important to emphasize objective techniques of recording data and observations before generalizations regarding residential environments are made.

The overall purpose of Part I is to help the student identify and describe selected characteristics of residential communities. Most of the activities will be outdoors, carried on with the potential for appropriate indoor follow-up activities.

Activity 1: Describing Kinds of Dwelling Units

The student will be able to make statements quantitatively, describing the number of single family homes, duplexes, garden-type apartments, and high-rise apartments found in a study area.

Procedures:

The student will –

1. Walk in an area and list the kinds of dwelling units present.

2. Identify on a zoning map the section he walked through.

3. Describe what kinds of dwellings may be built in sections adjacent to the study area or in the study area itself.

Materials:

Zoning map of study (Copies may be obtained from Maryland National Capital Park and Planning Commission.)

Activity 2: Assessing Dwelling Unit Population Density

Instructional Objective:

The student will be able to identify the approximate number of people per dwelling unit.

Procedures:

The student will –

1. Interview local residents while on a field trip to determine the number of residents per dwelling unit.

or –

2. List the number of residents in four dwelling units close to his own home.

3. Pool data on people per household, order them by area, and find the average number of persons per household in a given area.

Note:

Some students may also be interested in collecting data on the age (or approximate age) of individuals in these families. To achieve good comparisons, a sample size would be 10 per each type of dwelling unit. A useful introduction to these procedures might be for the student to question his own family as a homework assignment. Several parent chaperones will make it possible for the whole class to participate in different areas for a neighborhood.

Interviewing procedures are discussed on page 11.

Activity 3: Observing Residential Space Utilization

Instructional Objective:

The student will be able to describe the size of building lots in relation to the kind and number of dwelling units present.

Procedures:

The student will –

1. Pace off or otherwise estimate the length and width of various building lots and take notes on the kind and number of dwelling units present on each lot that is measured.

2. Determine the number of square feet (or square meters) of space available for use per building lot and per dwelling unit.

3. Identify building restrictions observed in terms of the kind of zoning as shown on the zoning map.

Note:

Pacing is a measuring method. The student computes the average length of his footsteps over three walks along a measured straight route. (See Environmental Education Activities for Map and Compass Study.)

An acre zoned R-90 (residential: minimum front footage of 90 ft.) can accommodate three houses. An acre zoned for townhouses can accommodate 10.

Activity 4: Identifying Architectural Diversity of Residential Areas

Instructional Objective:

The student will be able to identify various types of architecture for dwellings and name the building materials used.

Procedures:

The student will –

1. Take a field trip and record the kinds of house designs observed; e.g., rambler, Cape Cod, Dutch colonial, ranch, modern, etc. Notes will indicate building materials used and the placements of buildings on the lots.

2. Order and tabulate the data for a given vicinity. Students may pool data from various streets or blocks and list the frequency of variation in design, building materials, and landscaping.

Materials:

dittoed tables or other note-taking equipment

Note:

Pictures of various kinds of houses may be available from real estate agents. Magazine pictures may be used.

Activity 5: Identifying Duration of Residence

Instructional Objective:

The student will describe the community in terms of families' duration of residence.

Procedures:

The student will –

1. Take a field trip and note the number of "For Sale" signs found in a given area. This exercise may be repeated at various intervals.

2. Observe the classified sections of newspapers and record the number of advertisements for the sale and rental of housing. Maps may be used in conjunction with this phase of the study. Real estate salesmen may also be invited to discuss housing turnover with respect to certain areas.

Note:

On the basis of the data collected, students may make reasonable conjectures about community mobility and its causes.

Activity 6: Identifying Community Services

Instructional Objective:

The student will be able to identify some important community services.

Procedures:

The student will –

1. Observe, on a walk or bus ride through the community, and record the following kinds of information:

   a) Does it appear that trash and garbage are picked up regularly?

   b) Are streets in good condition? (i.e., no pot-holes, etc.)

   c) Is public land well cared for?

   d) Are public facilities such as parks available?

2. Find out whether police aid and fire fighting services are readily available in this community.

3. Compile the above information and share any additional items that fall into the general category of community services.

Activity 7: Observing Residential Street Use

Instructional Objective:

The student will identify various kinds of residential street use.

Procedures:

The student will –

1. Take a field trip and make notes on the following:

   a) Are streets used for pedestrian traffic? Have sidewalks been constructed?

   b) Are streets used for automobile parking and/or storage, or do dwellings have off-street parking available?

   c) Are the streets built to carry rainwater to storm sewers?

   d) What kinds and number of vehicles use various streets during a predetermined time period?

   e) What streets are used for public transportation service such as buses?

   f) What evidence can you find that the streets are used for play areas?

   g) Is there any evidence that residents do repair work on their cars in the street?

   h) Observe kinds of intersection regulations both downtown and in a suburban area. Do drivers seem to obey traffic signals?

   i) Do the streets seem to be a major source of noise?

   j) Do the streets appear to be clean?

2. Discuss with the rest of the class the observations made and arrive at objective statements regarding the data collected on street use.

STUDENT EVALUATION SHEET

Student's Name _____

Part I	Observed	Not Observed
1. Describes kinds of dwelling units	_____	_____
2. Assesses dwelling unit population density	_____	_____
3. Observes residential space utilization	_____	_____
4. Identifies architectual diversity of residential areas	_____	_____
5. Identifies duration of residence	_____	_____
6. Identifies community services	_____	_____
7. Observes residential street use	_____	_____

PART II – IDENTIFYING CHARACTERISTICS OF COMMERICAL/INDUSTRIAL AREAS

The overall purpose of Part II is to help the student to identify and describe selected characteristics of commercial and industrial areas.

Activity 8: Describing Patterns of Commercial and Industrial Communities

Instructional Objectives:

Students will describe on a chart the businesses and industries in a commercial and/or industrial community.

Procedures:

1. The teacher and students will identify the boundaries of the area to be studied.
2. The students will select categories and prepare a chart for recording data. (See page 10 for chart.)
3. The class may divide into groups to examine various parts of the area.
4. Student groups will pool information.
5. Students will chart information.

Materials:

clipboards or hard surface for writing
chart of categories (See page 10.)
pen or pencil

Note:

These activities are most appropriate for small groups which should be carefully supervised to avoid large gathering of children in a single commercial or industrial enterprise.

The teacher should consult proprietors or managers before undertaking this activity.

Categories of Characteristics of Commercial and Industrial Areas

Name of Establishment	Size of Building	Age and Condition of Building	Use of Building	Nature of Area Surrounding Building (grass, concrete)	Ownership Management of Enterprise	Number of Customers of Clients Present

Presence or Absence of Current Construction	Evidence of Maintenance Indoors and Outdoors	Presence or Absence of Refuse Containers	Business Hours	Approximate Size of Parking Facilities	Number of Vehicles on Lot (approximate)	Types of Vehicles

General condition of total area showing efforts at neatness, attractiveness, landscaping_____

_____

Activity 9: Gathering Data through Interviews

Instructional Objective:

The student will practice his abil[illegible]ew effectively by gathering usable data from people in his area.

Procedures:

The student will –

1. Ask managers and owners of the enterprise for information and record it on charts. Include such information as:

Nature of enterprise	Number of employees	Age of enterprise in area	Geographic origin of selected products sold	Service provided

2. Ask employees for information and record it on charts. Include such information as:

Length of time in position	Training necessary for position	Total miles travelled daily to and from work

Materials:

notebook or tablet
pen or pencil

Note:

This activity may not be appropriate for all students. The teacher should emphasize that not all people will be willing to answer the questions listed. Information from informal conversation could also be included as data. Other suitable questions might be agreed upon by class members. The teacher should make arrangements with owners and management to be sure that interviewing is acceptable.

Activity 10: Distinguishing between Opinion and Fact

Instructional Objective:

The students will distinguish between opinion and objective observations in order to select usable data.

Procedures:

1. Students will discuss and agree on categories for sorting observations for analysis. They will accept factual data and formulate judgements based on a completeness and kind of data; reject opinion when it is inappropriate; and agree to accept opinion within the framework of how it is formulated when factual data is beyond the individual's ability to evaluate.

2. Students will identify those establishments they have observed to be service providers or goods providers.

3. Students will discuss the appropriateness of descriptive terms such as *big, small, few,* and *many* as opposed to actual size or numbers.

4. Students may develop their own categories for classifying the data they consider acceptable.

Note:

Helping students to discriminate between fact and opinion (and the uses to which both serve students and adults) may require considerable work on the part of the teacher.

Activity 11: Evaluating Observations

Instructional Objective:

The student will describe parts of the area he has studied as being artistically satisfying or offensive and as being potentially harmful beneficial to the health, privacy, and environment of members of the community.

The teacher will allow differences of opinion but will require support of each opinion.

Procedures:

The student will –

1. Identify the presence or absence of safety measures in the area; e.g., lighting, provision for pedestrians, speed limits, etc.

2. Identify attempts to beautify the area.

3. Identify disorder caused by construction or inadequate space and predict or suggest useful changes.

4. Identify need for improvement in the appearance of the area, probable causes of of present conditions, and possible methods of change.

5. Identify the need and provisions for privacy in the area.

6. Identify hazards to health or environment and predict or suggest improvements.

Note:

Differences of opinion about what is aesthetically satisfying are likely to occur. No final decisions are necessary, but discussions will be useful in order to help students develop their appreciations and their ability to verbalize.

Activity 12: Determining Rates of Change

Instructional Objective:

The student will list chronologically the changes and growth which have taken place in the community he has visited.

Procedure:

The student will –

1. Select from interview reports the information concerning the ages of the enterprises he has visited.
2. Locate on old maps and on a current county map the area he has visited.
3. Order chronologically as many as possible of the landmarks and roadways in the area.
4. Examine on the old and new maps the nature of the area surrounding the community he has studied.
5. Construct a plan for future development (a projection) of the area for a given period. (e.g., 5 to 10 years)

Materials:

old and new maps of Montgomery County

Note:

This activity could last the year long, comparing data gathered in June with that gathered the preceding September. Photos taken in September and in June should facilitate comparisons. Old maps may be borrowed from some social studies teacher specialists or ordered from Robert B. LaRue, Post Office Box 182, Silver Spring, Maryland 20907. More recent county maps are obtainable from Montgomery County Historical Society, 12 Park Lane, Rockville, Maryland 20850.

STUDENT EVALUATION SHEET

Student's Name_____

Part II	Observed	Not Observed
8. Describes patterns of commercial and industrial communities	_____	_____
9. Gathers data through interviews	_____	_____
10. Distinguishes between opinion and fact	_____	_____
11. Evaluates observations	_____	_____
12. Determines rates of change	_____	_____

PART III – IDENTIFYING PATTERNS OF CITY GROWTH AND LAND USE

The overall purpose of Part III is to help students note changes in city growth and land use and, when possible, to identify causes for these changes. It is designed primarily to promote the use of data and observation as bases for intelligent concern about influences on the quality of life at present and in the future.

Activity 13: Identifying and Classifying Uninhabited Areas

Instructional Objective:

The student will identify green or uninhabited areas on a trip from the inner city of Washington to his home school in Montgomery County. He will record the number of such areas and describe them.

Procedures:

The student will –

1. Define a green area as a space at least as large as a city block where things are growing.
2. Note the location of the area and the nature of surroundings; e.g., residential, business, etc.
3. If possible, identify the use of the area or the reason for non-use.
4. Estimate the size of the area in units of city blocks.
5. Note parking regulations along the trip route and make conjectures about reasons for differences or similarities.
6. Count the number of "For Sale" signs on vacant lots. Notice whether the sign tells the zoning regulation.

Activity 14: Analyzing Highway Patterns

Instructional Objective:

The student will identify the numbered state and national highways on a trip from the inner city of Washington to his home school and list the cities through which they pass.

Procedures:

The student will –

1. Note highway number signs on the trip route.
2. Locate the route of his trip on a local map.
3. Find on a Maryland map the highways he has listed.
4. Trace the route of the highways he has listed.
5. List the towns and cities through which these highways pass.
6. Identify on the map the symbols indicating population size for cities, towns, and villages; and find one of each size on one of his traced routes.

Materials:

maps of Maryland (available free from Maryland State Roads Commission, Baltimore, Maryland 21201 or ask teacher-specialist to obtain them)
commercial road maps, if they have the pertinent features

Activity 15: Analyzing Land Use from Map Study

Instructional Objective:

The student will identify sparsely populated areas on a road map of the United States.

Procedures:

The student will —

1. Identify major highways and secondary roads on any road map.
2. Identify entrances and exits leading to and from major roads.
3. Note those eastern cities that have "beltways."
4. Locate any distance on a secondary road greater than 10 miles which does not pass through a town. Speculate on reasons for no towns.
5. Identify an area of Montgomery County with which he is familiar and find it on a map of Montgomery County, a map of Maryland, and a map of eastern United States.

Materials:

maps of eastern United States, Maryland, and Montgomery County

Activity 16: Locating Rail and Air Terminals

Instructional Objective:

The student will use maps to locate airports and railway terminals.

Procedures:

The student will –

1. Estimate distances between major airports, using the scale of any road map.

2. Trace the routes of railroads and determine their primary use.

3. Visit an airport to note frequency of flights, destinations, and time required in flight; or obtain a flight schedule to collect the same information.

4. Select a city of destination. Note time required to reach the airport from home, and inquire about time required to travel from the airport to downtown at the city of destination.

5. Visit a railroad terminal to note frequency of arrivals and departures, destinations, and schedules; or use a timetable to obtain the same information.

6. Compare costs and speeds of air and rail travel.

Note:

When on field trips, it may be appropriate to stop at airports and rail or bus terminals so that students can observe the number and kinds of activities occurring there and so that they may determine the reason for the location of the terminals. Ask social studies teacher specialist for assistance in getting schedules.

Activity 17: Analyzing Land Use from Observation

Instructional Objective:

The student will identify areas which are not desirable for homes by using maps and taking trips within his own community.

Procedures:

The student will –

1. Note the size of areas beside major highways.
2. Note on a map the areas near airports.
3. Note on maps or in his community those areas reserved for parks and sites for future schools.
4. Note on maps or in his community those areas zoned for industrial use.
5. Note the frequency of loud noise, air pollution, objectionable odors, and other hazards to health and safety.
6. Note on a zoning map the areas near railroads.

Materials:

pencil and paper
Montgomery County or Maryland maps
zoning maps (for sale by the MNCPPC)

Activity 18: Observing Building Height

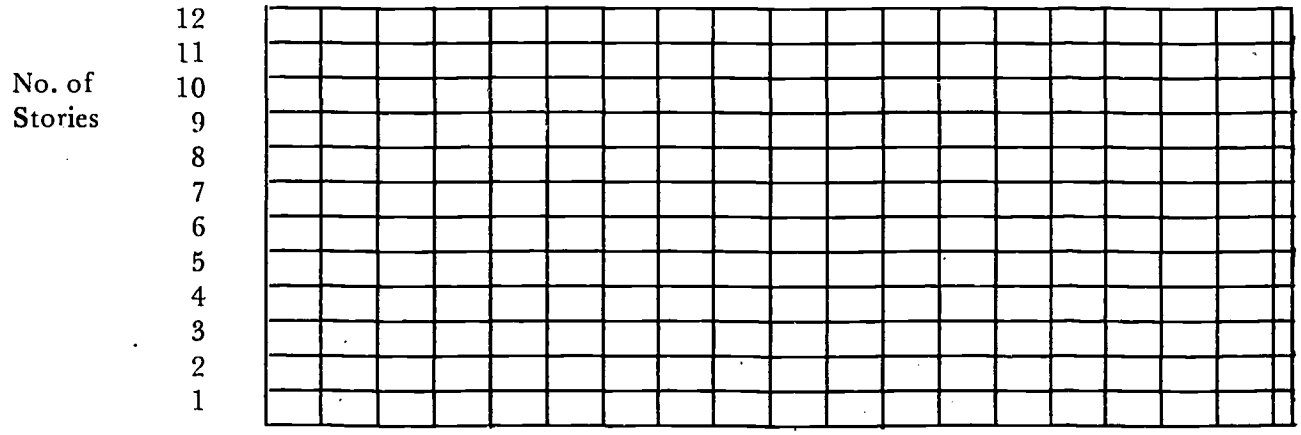
Instructional Objective:

The student will identify the variations in height of buildings from city to suburb on a designated portion of a bus trip.

Procedures:

1. After a field trip to downtown D.C., the student will note the height of buildings on the way back to his home school. For each distance unit, make a statement about the average number of stories the buildings have.

2. Students should pool data and agree on averages for each block or designated section, and plot data on a graph such as the one below.



*It is not necessary to use *blocks;* distances agreed on as indicated on an odometer may also be used.

Materials:

pencil and paper
dittoed blank graph sheet

Note:

The observations may produce a negative rate of height because of the 10-story regulation in D.C. and the high-rises in the suburbs.

Activity 19: Observing Street Activity

Instructional Objective:

The student will describe the activity of people observed on the street.

Procedure:

The student will –

1. Make detailed notes regarding *what* is occurring on the streets of various business and residential sections. Are people mostly children or mostly adults? What are their approximate ages? Are they men or women? List the specific kinds of activity observed.

2. Compare street activity in the city with street activity in the suburbs. Discuss the factors involved in promoting certain kinds of activities.

Materials:

pencil and paper

Note:

A discussion before this activity can yield a number of interesting categories of activity. Compare with actual activities viewed.

Activity 20: Observing Small Green Areas

Instructional Objective:

The student will describe small areas that are intended for green, grassy sections.

Procedures:

The student will –

1. Look for lawns, shrubs, and flowers in business and residential areas and record the condition of such, taking particular note of exposed soil on which nothing is growing. Do these conditions occur in any predictable pattern?

2. Discuss possible reasons why small uncultivated areas occur. Does use or population density have any effect on this condition?

Materials:

pencil and paper

Activity 21: Observing Width of Streets

Instructional Objective:

The student will describe the major streets in terms of the number of traffic lanes present.

Procedures:

The student will –

1. Note the number of automobile lanes and look for indication that the roads have been widened. The effects on homes and business in these areas should also be noted.

2. Discuss the effects of street widening and increased use of roads on an area.

3. Note the number of traffic lights and hypothesize on their specific locations. Are more needed? Where? Why?

4. Note the number of one-way streets. Are they one-way all the time or for just a certain number of hours a day? Which hours? Why?

Materials:

pencil and paper

Activity 22: Observing Building Use

Instructional Objective:

The student will describe building use in terms of apparent original intent.

Procedures:

The student will –

1. Note the kinds of activity taking place in various buildings. Record information about the physical features of the building. Was the original intent of a structure a house, a store, an apartment house, etc.?

2. Discuss the factors that result in buildings' being used for purposes other than the original intent.

Note:

Information for this discussion and listing activity may come from student's own knowledge or from questioning parents as well as from observations made on field trips. This activity may be combined with activities in Part II.

Activity 23: Observing Alleys

Instructional Objective:

The student will describe the frequency of occurrence of alleys observed on a trip from the center of a city to the suburbs.

Procedures:

The student will –

1. Define "alley."
2. Make detailed notes on the areas where alleys are found; their size, use, and general condition.
3. Discuss the function of alleys as observed at various points during the trip. Do all alleys serve the same purpose? Are alleys necessary?
4. Observe the kinds of human activities that takes place in alleys. Are they used for play areas? Are they used as regular traffic routes? Are any residences located on alleys? Discuss safety factors.

Activity 24: Interpreting Suburban Growth

Instructional Objective:

The student will interpret the significance of a new subdivision and general commercial development next to an active farm.

Procedures:

The class will –

1. Take a bus field trip near the outskirts of Rockville and note the kinds of activities going on; e.g., farming, commercial and/or industrial building, housing developments, etc.
2. Discuss:
   a) What will happen to land prices in the future?
   b) Are transportation facilities such as roads and bus lines adequate?
   c) Is there evidence of planning for parks and open space?
   d) Where do you think the people are coming from who will move into the newly developed area?
3. Estimate when large commercial or industrial buildings were erected and relate their ages to those of residential buildings.

Activity 25: Observing Parking Facilities

Instructional Objectives:

The student will take a bus field trip from the inner city to the suburbs and describe parking facilities.

Procedures:

The student will –

1. Note the number and kinds of parking facilities in suburban and inner city areas. Indicate parking fees, if possible.

2. Pick a random sample of 30 cars in an open parking lot and count the number of D.C., Virginia, and Maryland license tags respectively. This should be done in the suburbs as well as the inner city, if possible. Who uses the parking facilities in various areas?

3. Compute the weekly cost of parking in several different downtown parking facilities.

Materials:

pencil and paper

Activity 26: Measuring a Parking Lot

Instructional Objective:

The student will identify the approximate size of a large parking lot.

Procedures:

The student will –

1. Pace off or otherwise measure a section of a parking lot, e.g., space marked for several cars, or one lane of spaces.

2. Count the number of lanes or spaces, and estimate how many cars could be parked there.

3. Calculate the total area in square feet or meters.

4. Calculate the area in acres.

5. Compare square footage of lot with square footage of buildings.

Note:

A square measuring about 209 feet on each side can be marked off on the school grounds to give students an idea of the size of one acre.

Activity 27: Tracing a Drainage Pattern on a School Ground or Parking Lot

Instructional Objective:

The student will identify the approximate amount of water that falls annually on a given area.

Procedures:

The class will –

1. Measure a paved area such as a parking lot or school black top.
2. From an almanac or encyclopedia, find the average annual precipitation for Maryland. (About 45 inches)
3. Calculate the cubic feet of water which will fall on the measured area. (There are about 7.5 gallons in one cubic foot.)
4. Locate the storm sewers or drainage ditches into which the water runs.
5. Attempt to find the eventual disposition of the water; e.g., is there a creek nearby? Notice whether the water is clear or murky or muddy or otherwise polluted.
6. Make a map of the school ground or a parking lot, and indicate places where water drains or leaves the area.

Activity 28: Analysis of Use of Vehicles

Instructional Objective:

The student will analyze the uses of family vehicles.

Procedures:

The student will

1. Estimate or ask parents the driving distances to and from their places of employment.
2. Estimate or ask parents the driving distances to major shopping areas.
3. Identify shopping or recreation areas accessible by walking or riding bicycles.
4. Identify types of employment that exist in big cities.
5. Identify types of employment that can exist in small cities, towns, and rural areas.
6. Identify the location of fringe parking areas.
7. Identify public transportation routes to places frequented.
8. On a field trip, stand at an intersection for a given period of time, or for a specified number of cars, count the number of people in each car and record the information.

Material:

pencil and paper

Activity 29: Identifying Air Polluters

Instructional Objective:

The student will observe and record sources of air pollution on a round trip from D.C. to his home school.

Procedure:

The student will —

1. Identify the *probable* sources of air pollution.
2. Practice counting and categorizing air pollution visible from cars, trucks, smoke stacks, aircraft.
3. Identify, if possible, the names of the truck companies or owners of smoke stacks.
4. Write letters of complaint.
5. Observe smoke from school. Is it from the heating system or the incinerator?
6. Find out from local officials the regulations about trash collection and disposal, leaf burning, etc.

Note:

Gasoline fuels produce carbon monoxide, carbon dioxide, hydrocarbons, and lead.

Diesel fuel produces all the same pollutants except lead.

Activity 30: Investigating the Demise of Trolleys

Instructional Objective:

The student will investigate the demise of the trolley car in metropolitan Washington.

Procedures:

1. The class will take a field trip to the National Capital Trolley Museum on Bonifant Road in Montgomery County. (Phone: 384-9797)

2. Discuss the following questions:

   a) Why was trolley service discontinued?

   b) Would it be advantageous still to have a trolley system?

   c) Did trolleys cause pollution the way automobiles and buses do? Explain.

   d) What disadvantages did trolleys have?

3. Locate former trolley routes in the area.

Note:

Use of electricity for trolleys causes pollution but much less and of a different kind than that caused by buses.

Activity 31: Visiting an Old Town

Instructional Objective:

The student will distinguish the differences between an old town, a newer town, and a large city.

Procedures:

The student will — on a class trip to Gaithersburg or Frederick

1. Identify enterprises or types of buildings not found in large cities.
2. If possible, identify the age of the town.
3. Draw conclusions, from information gathered about the reasons for the town's existence.
4. Note and describe signs of growth and change.
5. Make predictions about the town's future.
6. Estimate the ages of local cemeteries and certain buildings.
7. Characterize the distinguishing features of obsolescence and vigor as they relate to towns and cities.
8. Recognize that old towns can continue to "live" and develop without becoming cities.

STUDENT EVALUATION SHEET

Student's Name_____

Part III	Observed	Not Observed
13. Identifies and classifies uninhabited areas	_____	_____
14. Analyzes highway patterns	_____	_____
15. Analyzes land use from map study	_____	_____
16. Locates rail and air terminals	_____	_____
17. Analyzes land use from observation	_____	_____
18. Observes building height	_____	_____
19. Observes street activity	_____	_____
20. Observes small green areas	_____	_____
21. Observes width of streets	_____	_____
22. Observes building use	_____	_____
23. Observes alleys	_____	_____
24. Interprets suburban growth	_____	_____
25. Observes parking facilities	_____	_____
26. Measures a parking lot	_____	_____
27. Traces a drainage pattern on a school ground or parking lot	_____	_____
28. Analyzes use of vehicles	_____	_____
29. Identifies air polluters	_____	_____
30. Interprets the demise of trolleys	_____	_____
31. Distinguishes between old towns and large cities	_____	_____

SUGGESTED DISCUSSION QUESTIONS

Most of these questions have several answers, both positive and negative. Students' opinions should be accepted and respected unless they are clearly based on lack of information or misinformation.

1. What is a city?
2. What is the effect of population density on the quality of life?
3. How close should a residential district be to an active commercial area?
4. What is the role of the automobile in metropolitan areas?
5. Do certain kinds of developments promote the use of the automobile?
6. How far north do the Washington suburbs extend? How far can they extend before reaching Baltimore's suburbs?
7. Where should sanitary land fills be located?
8. What are rivers used for in metropolitan areas?
9. What are the effects of road and other construction on streams and rivers?
10. Who determines how land will be used?
11. Of what value is privacy?
12. How does metropolitan growth affect people's responsibility to their fellow men?
13. Must cities grow? Explain.
14. What determines where people live?
15. What are some reasons why people move?
16. How are new suburbs different from old suburbs?
17. Do patterns of city growth promote racial segregation? Explain.
18. Do patterns of city growth promote economic segregation? Explain.
19. Are racial and economic segregation related? Explain.
20. How does city growth affect health?
21. What cause a slum?
22. Should there be a limit to the number of apartment developments and/or units in a given area? Explain.